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U.S. NAVY

approach

As we go to press for this issue, it has been announced that the Royal Maces of Attack Squadron Twenty-seven are to be the first recipients of the Grampaw Pettibone Award, sponsored by DCNO-Air. This award will be given annually to the person or organization who best contribute to naval aviation safety through publication. VA 27, an A-7E Corsair II squadron based at NAS Lemoore, California, was chosen for 1985 in recognition of their command-sponsored writing program which has generated many high quality articles for Approach as well as many other service publications. The award will take the form of a trophy topped with an original bronze sculpture of Ol' Gramps himself.

The Approach staff applauds the choice and extends our congratulations to VA 27. Their bold, innovative command writing program made them the clear choice for 1985 and sets an extremely high standard for this new award.

John Flynn
Editor

inside approach

Vol. 31 No. 8

Cover illustration of an A-7 Corsair II by Approach artist Blake Rader.

FEATURES

DEPARTMENTS

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Keep Awake for Wake

By Bud Baer

. . . He flew into wake vortices and suddenly rolled inverted . . .

Turbulence

THE lead aircraft was in a hard port turn, positioning himself for a simulated attack on the airfield. His wingman was in trail position at 500 to 600 feet AGL, also in a hard port turn at 380 KIAS.

The wingman then attempted to fly under lead's "jetwash" while crossing lead's 6 o'clock. He flew into wake vortices and suddenly rolled inverted with the nose down at 10 to 15 degrees.

Fortunately, he quickly recovered his TA-4F by employing a 6G rolling pull-out maneuver. In the process, though, his wing clipped off the top of a pine tree. Luckily, he experienced no problem returning to base and landed safely. Aircraft damage was minimal.

The pilot got into trouble by flying beneath the lead into the periphery of a right wake vortex. Had he flown closer to the core of this whirling mass of air, he could have "bought the farm."

"More emphasis and education needs to be placed on wake turbulence as it relates to tactical low altitude training in both the fixed and rotary wing communities," his CO noted. "In fixed-wing piloting we must constantly remain alert to the hazard of wake vortices in the low altitude tactical environment, such as the one encountered by this A-4.

"Two things a pilot flying below 500 feet AGL must keep in mind in preventing such incidents are (1) never fly below the lead and (2) never exceed 90-degrees angle of bank with the nose below the horizon. Additionally, a vortex encounter as high as 1,000 to 1,500 feet AGL will require an unusual attitude recovery, compromising safe terrain clearance. Avoidance of wake turbulence must be stressed continually."

The phenomenon of wake turbulence is almost as old as aviation itself. Initially it was attributed to propwash and later to jetwash. Although these cause different effects and generally are not hazardous, they are terms still commonly, though incorrectly, used in referring to wake turbulence.

Wake turbulence became prominent and was recognized as a potentially serious hazard in the early 1960s as a result of several takeoff and landing mishaps. Safety experts began to study it more intensely. Most of the research was done by the civil aviation industry and by aeronautical engineers, tending to focus mainly on the takeoff and landing aspects of flight. Proper control of the airport environment was considered the primary means to eliminate this hazard.

Later, however, it became evident that wake turbulence was also encountered in the fixed-wing tactical environment, particularly during ACM (air combat maneuvering). It was felt in the form of mild thumps or buffets. Sometimes it was unusually violent and tossed aircraft in one or more axes. On rare occasions, overstress occurred.

Wake turbulence was not generally considered a serious hazard because it usually occurred during ACM at medium altitude, was extremely infrequent and was virtually impossible to either predict or avoid. (The A-4 NATOPS flight manual and technical manual don't even refer to wake turbulence.)

More recently it *has* been recognized as a serious danger to helicopter flight during evasive maneuvers, but not much attention has been given to the effect on fixed-wing flight, except for the takeoff and landing phases. Even then, it has been considered "serious" only when the lead aircraft is a "heavy," i.e., a plane of 200,000 pounds or higher gross weight. This recent A-4 incident brought out in loud and clear terms the fact that wake turbulence *does* apply to the low altitude tactical environment.

Aerodynamic gross weight increases with G loading. For example, a combat ready F-4 with a load of bombs (50,000-pound gross weight) pulling 5Gs produces the same wake vortices as a 200,000-pound KC-135. They are created when the air, disturbed by the wing span, begins to roll up behind the aircraft. Two vortices, sometimes called "horizontal tornadoes," are created behind the wing tips, beginning several wing spans behind the plane. In the final phase, they expand and dissipate with respect to time, interaction with one another, prop/jetwash and atmospheric conditions at the time. An attempt to avoid them by flying below an aircraft in a low altitude environment is the worst possible option.

High G maneuvering by a fighter or attack aircraft creates the same wake turbulence as a much larger aircraft in 1G flight. Conversely, if a vortex is held as a constant, an aircraft under high G at the time of the encounter is much more endangered than an aircraft meeting up with the same vortex in 1G flight. These facts, when the low level flight aspect is added, underscore the severity of the potential hazard.

Be particularly alert for wake vortices in hard turns during such low level training and tactics flying as navigation, stream raids, coordinated strikes and high threat strike tactics (ingress, pop-up attacks, level lay-down deliveries, jinks, departing the target and egress).

To avoid the problem, remember that wake vortices do occur, particularly during ACM; so at low altitude, remain above the lead, and don't exceed 90-degree AOB with the nose below the horizon. If you do, you may suddenly be confronted with the same conditions that greeted the A-4 pilot who clipped the pine tree. Even worse, you may encounter conditions in which recovery of your aircraft or successful ejection is impossible. ◄

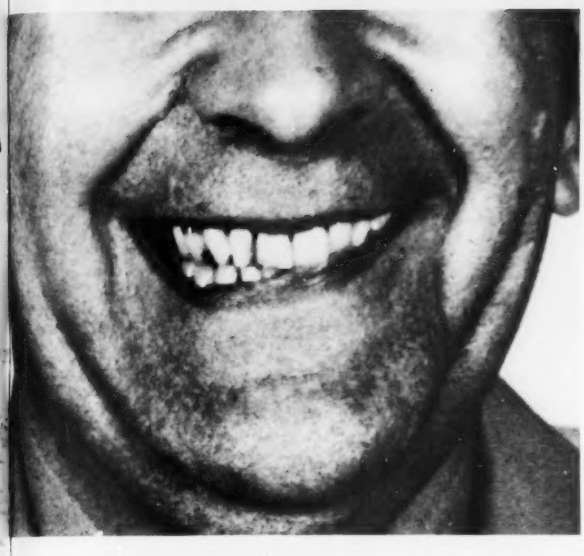
Bud Baer is a staff writer for Approach.

A Helo Crew Exposes

By LCdr. "Duck" Drake

IT was a super deal; a 1430 brief, 1600 takeoff and 1900 recovery. You could be home in time to catch a late dinner and settle in for the baseball game before the 2000 sunset. The weather was sunny with only a few puffy clouds pushed on by a light wind. The air had already warmed to the mid 70s by brief time. Yes, a fine deal, an H2P day FAM flight instead of herding papers was just what you needed to help finish off the week in style.

Sauntering into the briefing room, you note the safety



Themselves

officer camped out at the rear of the room with an out-of-character, perverse grin marring his usually placid countenance. The thought crosses your mind that he is probably here to spot check the SDO's flight brief and the ensuing individual crew briefs. But why the smile? The SDO enters with a bounce to his step and visible excitement that gives you a start. Hey! Something is up. "Attention to the brief" comes from the SDO as a chortle. "There has been an aircraft change and mission change to event four. The good news is that you are not cancelled. The bad news is that you don't need an aircraft."

A sinking sensation hits you as you realize that something is in fact up, but that things are not "looking up." "Your mission is a bay-swim evolution during which you will evaluate the hypothermic effects of 15 minutes of 66-degree Fahrenheit water."

A few expletives cross your mind as you realize that even your thermal underwear is still in your gear locker, much less your dry suit. Glancing at your fellow crew members confirms similar gear and thoughts. The brief continues with information about standby-rescue swimmers, safety precautions and safety equipment, but your mind is nagged by the question of how cold is it really going to be? It's summertime in San Diego; it **couldn't** be as cold as most waters around the world. The safety officer remarks that in the 240 at-sea carrier rescues he reviewed, the average time in the water was 19 minutes — not just 15; hence, this is a "break." Your thoughts are on breaks, but the rap for felonious assault keeps you in your chair.

Suddenly an inspiration strikes you. Having some knowledge of experimental technique and an honorary sea lawyer degree from a major non-accredited university, you point out that for the exercise to be truly instructive the crew should enter the water with a range of protective gear to evaluate the hypothermia protection offered by each.

Some relief arrives when you realize that you've talked your way if not out of the water, at least into a dry suit for yourself, insulated underwear for your co-pilot and a wet suit for your first aircrewman. However, the second aircrewman appears unmoved by your collective good fortune.

As the brief finishes with the logistics of transportation and warm fresh water showers, you remember the recruiting slogan about jobs and adventure, but the adventure of being randomly float checked had never been mentioned by any recruiter to whom you spoke. However, for science, knowledge, liberty and the defense of the free world you rise in resignation. Maybe we'll get something out of this besides another good sea story.

The following statements were collected from the crew:

Dry Suit Pilot. Upon initial water entry, air in various voids of the dry suit went to the shoulder and chest areas. This air escaped through the neck within two minutes. The suit still remained bouyant. However, with the constrictions of an SV2 and LPA, the air could have difficulty escaping and thus be possibly trapped in the lower extremities, making you float upside down. With the loss of the air layer, the suit tended to constrict, particularly around calves, thighs and shoulders. This led to restricted mobility. Of all the survival swim strokes attempted, the backstroke proved most effective. The con-

striction hindered crawl, side and breast strokes. Leakage was noted first around the calves then it felt as though it was coming through the upper zipper and inching down. Upon removal of the suit, the liner was soaked and each bootie was about three-fourths full. Approximately one-half gallon of water pooled in the suit. Cold was no factor and my hands were not even numbed. In colder water, the seepage would probably contribute to a faster onset of hypothermia.

The buoyancy of the suit could be a hindrance if I were trapped in the afterstation and could not pull hard enough against the buoyant force to escape the aircraft. I tried the burning oil technique of swimming underwater. The buoyancy made underwater swimming difficult and I could only make about 2 to 3 feet of progress per breath.

Overall, however, I felt the dry suit was superior to the wet suit for warmth but overbuoyancy/mobility problems could prove significant in extreme cases.

Thermal Underwear Pilot. My apparel for the 15-minute dip check in the bay was thermal underwear and a flight suit. I also had on a yellow flight-deck jersey.

Upon entry into the water, I did not get as much of a shock from the cold as I expected. As a matter of fact, I hardly felt any discomfort in the beginning. The actual cold did not become a factor until the last few minutes of the swim when my muscles began to tighten and movement became much more restrictive.

Other factors which affected my ability to survive were salt water ingestion and swimming against the current to maintain my position in the water. Of the three factors; cold, salt water, and exhaustion, I feel cold affected me the least.

In an actual situation, I would have simply drown proofed and ridden the current. Under such conditions, I feel I could have survived quite a while, at least two to three hours.

Wet Suit First Aircrewman (Qualified and Current SAR Swimmer). I jumped in wearing my full two-piece wet suit. As is usual with a wet suit, it leaked around the ends of the sleeves and legs and through the zippers. With a water temperature around 65 degrees it was not much of a shock. Within minutes my body had warmed the water inside the wet suit to a temperature that kept me warm throughout the remainder of the check. The greatest problem encountered was that any stroke other than a modified backstroke was nearly impossible.

Exhaustion came quickly with breast and crawl strokes. Cold water entered with almost every move I made. A big plus is that all that rubber provided me with an enormous amount of buoyancy, so I had plenty of energy to do the backstroke.

Flight Suit Only Second Crew (Qualified and Current SAR Swimmer). I had a chilling experience in the bay that day. I don't remember the water temperature, but it was **cold.** All I had on was my flight suit with a T-shirt and shorts underneath. The rest of the crew had more insulation between the water and themselves. Because of this, I feel my experience was the most important in determining how cold water affects a person.

When I first jumped in, I felt the coldness as a chill throughout my body. Then, just like swimming in the ocean on a cold day, I got used to the water.

When I hit the water, I started to drown proof. It was quite effective, and it kept me going. A few times, because of swells from passing boats, I aspirated salt water rather than air. Taking in water like that made me lose my drown proofing rhythm.

The first half of our experiment seemed to go slowly until I realized that thinking of being helpless in the water was not the answer. So I let my mind wander a little. I thought about home, work and anything to keep my mind from dwelling on the immediate problem. Of course I always kept aware of our simulated situation. When we talked to each other, I seemed to lose my breath so I kept speaking to a minimum. It's interesting; the majority of the time I didn't feel cold or weak. When I was told there were less than two minutes left, I started swimming as fast as I could because I wanted to see if I could actually swim as well as I felt. But I couldn't; I felt tired and very exhausted within a few seconds. I was fully convinced that even though I felt good while drown proofing, the coldness limited what I could do. At the end I didn't even have the strength to climb onto the dock.

Because of this experience, I've learned a lot about myself and my abilities. I now have a great deal more respect and understanding for my naval aircrewman and SAR training.

The lessons learned by our squadron's unannouced float check can be summarized as:

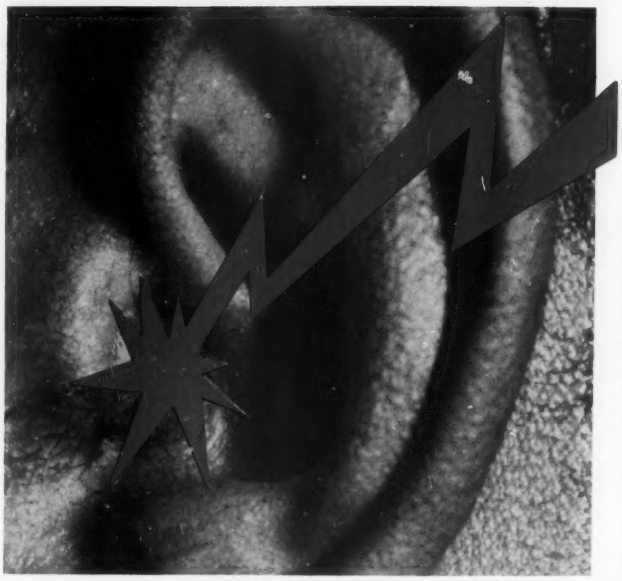
- Temperatures well-above NATOPS requirements for wet or dry suits can still have a hypothermic effect, especially upon fatigue and dexterity.
- The backstroke was the least fatiguing stroke, but drown proofing or the heat escape lessoning position (HELP) are both preferable in other than short exposure circumstances times.
- Restrictions to mobility and unwanted buoyancy could be a problem in underwater egress.
- Being in shape is going to assist you in a water survival situation.
- What you fly in is what you will wear when you enter the water.
- Never trust a smiling SDO. ◄

LCdr. Drake is the safety officer of HS 14.

Anatomy of an Earblock

or What Happens When You Fly With "the Sniffles"

By Lt. Jeff Georgia



A RECENT case I saw in sick bay was a classic example of what can happen when you fly with a head cold. Data taken at the time of treatment are presented to demonstrate graphically the forces involved inside the middle ear during a "block." Here is the scenario:

An aircrewman (Petty Officer Sierra Hotel) is on the schedule for a 10-hour operational flight. He awakens with a case of the sniffles, but can still clear his ears, so decides to press on since the mission promises to be exciting. During the mission, the virus causing the sniffles multiplies, strengthening its hold. At some point, while at altitude, the tiny eustachian tubes leading from his throat to his middle ears become blocked due to inflammation and secretions. This goes unnoticed since it is painless and the aircrewman is busy performing his in-flight duties.

During descent, however, P.O. Hotel begins to notice a sensation in his ears: first pressure, then pain. Despite great effort, he is unable to force higher density air into his middle ears with the valsalva maneuver since his eustachian tubes are shut tight. The correct procedure at this point would be to notify the flight station immediately of the problem. The cabin could then be depressurized back to the original altitude, equalizing the pressure on both sides of the eardrums, relieving the pain. Hopefully, using a slower descent and frequent, forceful valsalvas, equal pressure could be maintained onto the deck. This usually works unless the eustachian tubes are completely blocked.

In the case of P.O. Hotel, the descent was slowed, but cabin altitude was never regained. (After all, they had been out almost 10 hours, and the pain was bearable.) He landed with the outside of his eardrums at sea level, and the inside at cabin pressure of around 8,000 feet MSL. Now we all know that mother nature dislikes even a partial vacuum. One possible solution is for the eardrum to rupture and let the higher pressure in. Given that the eardrum is only several cells thick, I am surprised that this doesn't happen more often. The usual way that the ear equalizes the pressure is to dump fluid, particularly blood, into the middle ear. The space fills until the remaining air is at atmosphere. The pain eases as the tension on the eardrum is relieved. Hearing becomes drastically impaired, however, and the fluid takes at least two weeks to be reabsorbed. Sometimes the blood causes permanent scarring on the tiny bones in the middle ear. Throughout this time, valsalva is impossible and *grounding* is required.

Fortunately, Petty Officer Hotel decided to stop by sick bay prior to going to the debrief, the club and to bed. Upon examination, his eardrums were seen to be tightly stretched over the small bones of the middle ear ("retracted"), due to the high relative pressure outside the ear. He was taken to the base clinic where he was examined by the flight surgeon. P.O. Hotel was then given some nose drops to help dilate the eustachian tubes. Following this, a burst of high-pressure air was introduced into his nose in a simple procedure called "politzerization" which forces pressurized air through the obstructed tubes and into the middle ears, relieving the negative pressure. Once neutral (or positive) pressure is restored to the middle ears the danger of becoming filled with fluid is past. Thus, the crewman need only be grounded for his cold symptoms, rather than waiting the several weeks necessary for the fluid to be reabsorbed. Had he not decided to be seen immediately after the block occurred, his down time would have been five to 10 times as long as it was. In this case, P.O. Hotel's eustachian tubes opened within several days, valsalva became possible, and he went back "up."

Ear blocks can be more than uncomfortable; they can be fatal. Occasionally a single ear can block resulting in severe vertigo, which has been implicated in the loss of several single-piloted aircraft. Thus, blocks should not be taken lightly, and flying with a head cold should be strictly avoided. Colds have a way of worsening on long flights, so don't take chances. Be smart and get seen early. If your valsalva becomes "sluggish," take the two or three days grounding rather than several weeks of down time after the block. Petty Officer Sierra Hotel told me, "I'll never go flying with a cold coming on again." A word to the wise. ◄

Lt. Georgia is the flight surgeon with VP 11.

Sliding Tomcat. Preflight, man-up and start went as scheduled for the F-14 crew. They were slated for a routine day CQ, the first event of the day. The aircraft was positioned on the No.2 cat, and with five minutes to go before launch, the crew busied themselves with the standard pre-launch checks. Following tension, pilot selected zone-5 afterburner, and he and his RIO prepared themselves for the shot.

On the stroke, the crew felt the normal initial downward pull, but no acceleration. The pilot quickly retarded the throttles to idle, and applied maximum foot braking. He selected nosewheel steering and turned the aircraft across the bow, assisting deceleration. Simultaneously, the air boss made a quick, yet calm, call over the radio for the pilot to "come out of burner . . . get on the brakes." (The pilot later credited the boss with helping to save the situation.)

As the big fighter's travel slowed, the RIO determined they would be able to stop on the flight deck and made the decision not to eject. The F-14 slid approximately two-thirds of the way down the track before the main tires blew and the brakes seized. The plane finally stopped a little over 100 feet from the end of the flight deck.

Investigation revealed that the launch bar had not been properly positioned in the shuttle, resulting in the shuttle breaking free from the launch bar.

Gotcha! — Almost. The civilian Electra was preparing to leave the southeastern NAS. The Navy line personnel assisted with the engine start and were properly qualified and positioned for the procedure. No. 4 engine was routinely started, and upon a signal from the aircraft's co-pilot, the NCPP-105 starting unit was secured and disconnected. However, as the unit was being disconnected, the No. 3 prop began turning. The hose man dropped the hose and ran aft along the fuselage. The NCPP-105 operator remained where she was to avoid being sucked into the propellers. The plane director began frantically signaling for the pilots to shut down No. 3 engine, with no response. He then signalled for the two ground personnel to stay where they were and ran in front of the aircraft to get the pilots' attention. Finally, the engine was secured, all equipment removed and the start-up successfully continued.

Orion Chain Break. Prior to a night mission, the P-3 patrol plane commander (PPC) signalled the lineman to remove the chocks. After completing the crew brief, the PPC again signalled for the chocks to be pulled as well as the chains. The lineman gave an acknowledgement. Before commencing the start checklist, a second PPC in the left seat gave another signal to remove the chocks and chains. The lineman gave another signal acknowledging the command. However, after engine start and the taxi signal (flashing the wheel well light), and the power levers advanced, there was no movement.

The PPC returned the power levers to normal position, then advanced them again. This time, the P-3 lurched forward, accompanied by a loud pop and sparks from the right side of the aircraft. The parking brakes were set, and engines were shut down.

An inspection revealed one half of the tie-down chain still attached to the starboard nose ground mooring point. The other half was discovered 50 yards ahead and to the right of the aircraft. The lineman had failed to remove the nose tie-down chain as instructed by both pilots. Fortunately, there was no damage and the mission was flown as scheduled.

This squadron has now instituted the procedure of painting all chains with florescent/reflective paint to give greater visibility, especially during night operations. Additionally, the squadron changed the position of the lineman during pre-taxi checks to directly in front of the aircraft to ensure an unobstructed view of both

AIR BREAKS

sides of the aircraft for initial brake checks.

Deja Vu in a C-2? Did you ever see that frightening film footage of a C-2 that, after what appeared to be a normal launch from the ship, quickly entered a sickeningly steep port climbing turn, then plunged into the sea? The main cause of *that* mishap was improperly secured cargo which shifted during the stroke.

This C-2 was getting ready for a flight out to the carrier. The load consisted of seven pallets and was listed as weighing 4,900 pounds. The aircraft's loadmaster, however, was alert and became suspicious when he noted that each pallet was listed as having the same weight; 700 pounds. Calling on his experience, he decided that the pallets looked heavier than a mere 700 pounds, and he refused the load until it was recalculated.

It took one-half hour to accomplish the second weighing, but it was found that instead of 4,900 pounds — which had been described as "an average figure" — the total weight was 6,700 pounds. To complete his task, the loadmaster also checked the cargo for hazardous material and only then completed the loading process aboard the C-2.

The loadmaster's vigilance and professionalism broke the chain of events which would have resulted in an arrested landing aboard the carrier, with the aircraft 1,800 pounds over maximum trap weight, an unsafe situation at best; catastrophic disaster at worst!

AME1 Dale Divito of VR 24 gets a well-deserved pat on the back for catching a potentially disastrous situation and setting things right. Properly loading mundane cargo might not be as glamorous as working with bombs and bullets, but the task of the loadmaster — as well as the responsibility of all concerned to ensure a safe flight — is no less important. —Ed.

Hummer on a Wet Deck. The unique capability of turboprops to back up can be a time-saver, especially in the hurried atmosphere of the flight deck. However, that capability can sometimes create problems. Following a daylight recovery, an E-2 was backed under power toward a parking spot next to another squadron aircraft. The deck was wet, the ship heeled to port in a starboard turn, the aircraft's nosewheel was deflected full left, and the pilot increased power to add to the rearward movement. As the ship entered the turn, however, the aircraft came to a halt as the deck rose in the turn. Though the taxi director gave a signal to straighten the wheel, it remained fully deflected.

Once the ship steadied on course and the deck leveled, the Hawkeye began to move, continuing its turn, despite the pilot's efforts to straighten the wheel. The director gave a frantic stop signal but the aircraft momentum, strong axial winds and loss of braking effectiveness on the wet deck caused the E-2's port rudder to impact the starboard prop of a second E-2.

Backing Hummers into spots around the island is a precise operation. Whenever 30 knots wind over deck (WOD), ship turns and wet/slick non-skid are added, the situation quickly becomes unmanageable. The E-2 has very large lateral surface area with wings folded, making it very susceptible to high WOD. It may take a few minutes more to put an E-2 away with a tractor and tow bar, but it's time well spent. Initially position the E-2 with reverse power, but then hook up a tractor and back it into spot . . . The old fashioned . . . but safest way. — Cdr. D.L. Gracie, Head, Air Operations Branch, Naval Safety Center.

Quick Thinking on the Flight Deck. The flight deck of a carrier can be a bewildering and dangerous place, especially for a new-comer to the environment. While trying to get out of the blast of a taxiing F-14, a young sailor sought shelter behind the fuselage of a convenient E-2. The Hummer's engines were turning, and the sailor walked past numerous troubleshooters and around the nose of the aircraft, straight for the prop.

Spotting the young man and the imminent danger he was headed toward, an alert AT3 standing aft and outboard of the turning propeller, ran forward, and after getting the man's attention, motioned for him to halt. The sailor did not comprehend his shipmate's frantic signals and it was not until the 3rd class dropped to the flight deck that the "wanderer" understood and hit the deck. By this time, another crewman was able to reach the seaman and shepherd him to safety.

Inadvertent Seat Firing. The RF-4B held short of the runway prior to takeoff. After they lowered their canopies, both aircrewmen noticed a strange odor and the RSO told the pilot he smelled smoke. The pilot acknowledged and secured both engines, and began egressing. As he exited the cockpit, he noticed flames coming from the front cockpit's ejection seat and he called the RSO's attention to the added danger. As the RSO exited the rear cockpit, the front ejection seat fired, impacting the front canopy, shattering the plexiglas and dislodging the canopy assembly. The pilot, was struck on the back of his helmet by debris, and the RSO received facial burns from the ejection seat blast. The rear seat did not fire.

The cause of the incident was a fire of unknown origin. ◄

Some Things Never Change

By LCdr. Bob Alft

SAFETY officers, among many other things, are savers and filers of every scrap of information which passes over their desks. My predecessors were no exception to this rule. In a particularly musty old file I discovered the following letter and thought it held a certain value. I placed it in my top drawer and over the past year I have read it many times. Normally I am relieved to see how much progress has been made, and that the system does work; yet some of the same mistakes we made fourteen years ago keep on being repeated; only the names change.

4 Aug 1972

From: Safety Officer, USS *Westcoast* LPH
To: Safety Officer, USS *New Orleans*
Subj: Safety Turnover Information

1. We left San Diego on Oct. 1, 1971 and I was optimistic and confident that this would be a safe deployment. Only one accident of any real consequence occurred during my previous eight months aboard, when an electric hand-held Tennant machine got out of control, resulting in a lacerated finger to the operator. Unfortunately, my optimism turned to pessimism (and at times depression), with a feeling of "what will happen next." After extensive Monday morning quarterbacking it appears that many of these accidents could have been prevented. It is my hope that you will profit through our experiences and perhaps avoid many similar mishaps.

2. I will primarily address aviation safety because this is where most of our safety problems occurred.

a. We originally used Spot 1 as a launch and maintenance turn-up spot. However, one week after the Marine squadron embarked, a UH-1E scheduled for a test hop went over the side. The seas were 5 feet with relative wind 10 port at 28 knots. The Huey had been broken down preparatory to launch when the ship pitched down and rolled starboard. They commenced sliding across the deck, and the inexperienced co-pilot pulled in power, rather than holding down the collective and flying the deck. He lost turns, ended up in the starboard nets, and nosed over into the sea. All five aboard were rescued. After all was said and done, Spot 1 is now seldom used, except on very calm days or unless we spot the ship's helo there for launch.

b. The H-46 NATOPS Manual says that the H-46 can be engaged or disengaged in up to 45 knots of steady wind. We experienced at least two blade-to-fuselage strikes. These occurred on spots 2 and 3 with steady winds of less than 40 knots. Limiting engagement/disengagement to less than 30 knots of relative wind on these spots seem to have prevented any further occurrences of this nature.

c. The H-53 was great on engage/disengage winds, but when folded, its blade-securing mechanism is less than satisfactory if the winds are greater than 45 knots. The blade-securing device often failed under these conditions, allowing the blade to beat itself to death. The best solution we could come up with was to put all six 53s in the hangar anytime that high

winds were predicted. I have heard an East Coast Squadron has come up with a fix and is submitting it as a beneficial suggestion.

d. Moving those H-53s around the hangar bay in heavy weather is a bear. We had numerous crunches of one kind or another. The causes varied, but the ones which stood out were generally caused by inattention or poor judgment on the part of the director.

One crunch resulted when two ASEs began to move a forklift and the ship rolled port about 15 to 20 degrees. The forklift began to tip and the driver jumped off. The forklift righted itself but slid (brakes locked) into an H-53. Might be wise to brief your forklift operators on this one.

We had a couple of Huey ground handling wheels jump off and punch holes in the side of an aircraft. The squadron said our personnel were not installing them correctly and our people said they were. Finally, we agreed that crew chiefs would put the wheels on and pump them up, and we would move the aircraft. Evidently the squadron was right because as far as I know there have been no further occurrences of this nature.

e. The squadron lost two H-46s; cause undertermined. The first occurred at night, within one or two minutes of takeoff. Initially it was suspected that the pilots flew into the water. One week later at about 0745 the second plane crashed 45 miles from the ship. Wreakage indicated disintegratibn in flight. These accidents happened about the same time an H-46 crashed in Japan. Investigation showed that it was caused by a backing off in the aft transmission. This finding lent some validity to the theory that the same thing might have happened to our birds.

3. Four personnel from the embarked Battalion Landing Team were sitting outside the partially (two-thirds) open No. 2 elevator doors, but inside the raised stanchions. They had been sitting there over an hour and a half when a wave suddenly entered the door opening and crashed against the part of the door which was closed. Two of the four men outside the door were carried overboard. One man was rescued by the ship's helo, while the other was seen only briefly before disappearing beneath the surface. To give you an idea of how much water entered the door opening, a platoon undergoing a weapons inspection had been mustered in the center of the hangar bay aft, directly opposite the door opening. All these personnel were knocked down and washed against the boat dollies and helos. The seas were 10 to 12 feet with rolls of 12 to 15 degrees. At the time the incident occurred, the ship experienced a severe roll to port of about 20 degrees, followed by a roll to starboard of 15 to 17 degrees. Old timers who had been aboard since commissioning, said they had never seen or heard of a wave entering the hangar bay like that.

4. The ship's H-46 was tasked to pick up a conex box from an LPD. The box was supposed to weigh 3,000 pounds. About one mile into the transit following the pick-up, the pendant broke. The load was later computed to weigh 4,300 pounds. Our pendant was rated at 4,000 pounds and was somewhat old. Oh yes, the pendant was also hooked up incorrectly.

5. Those are some of the highlights of our safety picture during the cruise. I wish you a better record and hope that our experiences may at least help you to prevent similar occurrences. Good luck and safe sailing.

"Written in blood" comes to mind as I try to compose an appropriate conclusion. Admittedly operations are much safer today, and wind limitations are more restrictive. The Bennie Sugg for H-53 rotor blades is a reality. There are the tangibles. Safety awareness is the bugger that's hard to get a grip on. ***This*** *is the difficult area that we in the Navy have to fully commit ourself to.* ◄

LCdr. Alft is the safety officer on USS *New Orleans* (LPH 11).

Where Am I?

By Lt. Pete Riester

THE P-3 Orion began taxiing to Runway 25, NAS Cubi Pt., RP. The patrol plane commander (PPC) in the right seat was beginning his fourth flight in as many days and his confidence was high. This, combined with a sharp pilot in the left seat, seemed to guarantee a safe and productive dedicated field work flight.

In the Philippines most practice approaches are conducted at NAS Cubi Pt. or Clark AFB, so the "Clark Four Departure" was executed from Cubi bound for Clark. The distance from Cubi to Clark is approximately 40 nautical miles, and a departure from one field results in an immediate approach to the other. The departure to approach phase is a real co-pilot's nightmare with several radio changes, checklists and traffic calls in a 10-minute period. The PPC had flown this scenario several times and executed all calls and checklists without a hitch and the pilot at the controls positioned the Orion nicely for the first approach of the day at Clark AFB.

After several GCA approaches at Clark, the PPC requested radar vectors to final for a TACAN approach. This request was acknowledged and the appropriate vectors were given. During vectoring, the PPC asked to enter the VFR bounce pattern after the termination of the TACAN approach. Approach control again rogered the request and cleared the aircraft for the straight-in approach, instructing the PPC to contact Clark Tower at the final approach fix inbound (five DME from Clark).

Until this point all communications were being conducted on VHF since the controllers normally use a single frequency (UHF or VHF) to control each aircraft separately for each approach and touch-and-go. It is therefore possible for an aircraft to fly multiple approaches to touch-and-goes and never actually talk to the tower personnel.

While nearing the final approach fix, the PPC dialed in tower frequency on the UHF radio and positioned the

microphone select switch to UHF. The following transmissions were made on UHF:

PPC "Tower this is AB123, final approach fix inbound on the TACAN straight-in approach for a touch-and-go."

TOWER "Roger AB123, report three down and locked, cleared touch-and-go following a C-12 on base, other traffic is a C-2 on downwind in the VFR bounce pattern."

PPC "Roger, we have three down and locked, looking for traffic."

Both the pilot at the controls and the PPC immediately looked out the windscreen and scanned for the C-12 and C-2. It was a beautiful VFR day and with the P-3 now at four DME the PPC was concerned because he could not see traffic.

PPC "Tower this is AB123, request you call traffic again."

TOWER "AB123, say DME."

PPC "Roger, AB123 is three DME at this time."

TOWER "AB123, the C-12 is now on final, we still do not have you visually at this time."

At 2.5 DME, the PPC and crew could clearly see the entire runway and traffic pattern, but they could not see the C-12 that was now supposedly landing and worse yet, they could not see the C-2 on base. The flight station summoned its aft observers for a look, but no C-12 could be seen!

TOWER "AB123, state your DME at this time."

PPC "Roger, AB123 is at one DME now with negative traffic."

Visions of being on a collision course with a C-12 that he could not see made the PPC very nervous and he commenced a missed approach/wave-off.

PPC "Tower AB123 executing a wave-off at this time."

TOWER "AB123, state your position."

PPC "Roger, AB123 is midfield climbing through 1,200 feet to 4,500 feet. Executing the missed approach instructions." (The missed approach procedure was accomplished because the PPC felt uncomfortable with the present situation and elected to clear the airport traffic area.)

TOWER "AB123, What field are you at?"

PPC (Quite perturbed) "AB123 is midfield Runway 20 at Clark AFB."

TOWER "Roger AB123, this is Cubi Tower, I repeat, Cubi Tower, request you contact Clark Tower, immediately."

PPC ??!!!

The people in the cockpit of the P-3 were confused to say the least and the PPC examined his frequency set in the UHF radio. The frequency was correct, but the preselect/manual switch was still in the preselect position (preselect was set for Cubi Tower). The PPC had set the correct frequency but had forgotten to select manual. The aircraft was now past the field at this time and the PPC elected to switch back to Clark approach control on VHF. The rest of the flight was uneventful.

Hopefully both the pilots and the controllers learned a few lessons from this flight. First of all, had the PPC been using proper voice procedures (i.e., "Clark Tower" vice "Tower"), the confusion could have been stopped at the five-mile fix and prior to entering the tower controlled airspace. At fields located in close proximity to one another, it is very important that pilots know exactly who they are speaking to. In this incident the pilots thought that they had been cleared to land at Clark AFB by the tower. If the traffic calls had not made the pilots suspicious, the P-3 might have landed without actually being cleared, inviting major negative strokes ranging from collision through a flight violation.

Next, pilots must ensure that they **really** listen to what is being said on the radios. The pilots in this case expected to hear "Clark Tower" so even if "Cubi Tower" had properly identified themselves, the pilots might have only heard what they wanted to hear.

Finally, tower and approach control must ensure that they coordinate effectively when passing an aircraft from approach control to tower control. In this instance, Clark Tower should have been expecting to hear from the P-3 at the final approach fix and when they did not, the tower should have initiated a call using guard frequency (which the P-3 was monitoring) if necessary. Instead the P-3 was allowed to fly with no radio communications (NORDO) right through an often busy Clark airspace. When the PPC contacted Clark approach after the confusion, no questions were asked by the controller as to why the P-3 had not contacted Clark Tower.

This chain of events shows how a simple mistake of talking on the wrong radio can escalate into a potentially dangerous situation. Many checks and balances have been implemented to prevent such an occurrence and it is the responsibility of both pilots and controllers to follow correct procedures to ensure that flight safety remains our No. 1 objective. ◄

Lt. Riester is a P-3 pilot with VP 17.

The Contact Approach

By Lt. Jeffrey Walker

A CONTACT approach really is the black sheep of IFR procedures; in fact, it's found in the visual section of the air traffic controller's handbook. With it, the instrument pilot on an IFR flight plan sacrifices almost all the services and safety guarantees he normally enjoys, and enters the realm of "special VFR," an area in which he is not likely to be fully proficient. Fortunately, with so many airports now offering multiple straight-in approaches to two or more runways, Navy pilots seldom find themselves faced with a contact approach.

But when *would* you need to fly a contact approach? Consider the following scenario:

The weather at your remote detachment site is miserable, but so was your fuel management, and now you have no choice but to land there. Your problem? The field has instrument approaches to only one runway, runway 23, but the winds are 35 knots from the northeast and the runway is covered with snow and ice. You wisely decide to make a circling approach to runway 5, but ATC advises the weather has worsened and the field is now below circling minimums. What options are left?

You **could** attempt a downwind landing on icy runway 23, or you **could** hold and gamble that the weather will come up to circling minimums, but these options leave you feeling uneasy, and you are desperate for a better option. How about . . .

The Contact Approach. You may commence the approach to runway 23, which is above straight-in minimums, and advise ATC that you plan a contact approach to runway 5. Now, when you do break out, and if ATC approves the maneuver, you may begin you contact approach, **providing your flight visibility is at least one mile, you are clear of clouds and can reasonably expect to maintain those conditions to the field.** The controller will approve the request if the reported visibility at the field is one mile or greater.

Now you may fly to runway 5 by visual reference to the ground, i.e., following landmarks. *You are, in effect, conducting a circling approach below circling minimums,* without necessarily having the field in sight. On the negative side of the coin, you have sacrificed the 300-foot obstacle clearance guaranteed on a circling approach and *are wholly responsible for obstacle and terrain clearance.* With only one-mile visibility, you may not see the runway 5 landing environment, but because you are familiar with the geography and landmarks around the field, you can pick and feel your way along the ground until runway 5 is in sight, maintaining a healthy respect for your altitude and marginal flight conditions.

A Word to the Wise. The contact approach is certainly legal, even at an unusually low altitude, and can be a valuable tool to the instrument pilot, but you must consider some safety points before you begin. How familiar are you with the field? Do you have some established, pre-briefed points on the ground to use as guides to the landing runway? Have you practiced the maneuver on a VFR day, and have you decided on your own safe minimum altitudes for points along your route? Are you multipiloted, enabling one pilot to focus his attention on landmarks while one closely monitors and announces deviations in airspeed, altitude and rate of descent? Do you have a missed approach plan? Remember, *you are on your own* until established on a published missed approached procedure — how will you get safely established? And finally, do you really have the prescribed visibility and cloud clearance, or is it just wishful thinking?

Some Legal Points. In closing, lets review what civil and military publications say concerning the black sheep of IFR procedures:

- You must be on an IFR flight plan.
- You must request the maneuver; it cannot be initiated by ATC.
- You must have one-mile flight visibility and stay clear of clouds, and visibility at the field must be one mile or greater.
- You can request the approach only at fields having an instrument approach procedure, and your contact maneuver must be to a runway at that field.
- ATC will provide separation between you and other IFR and special VFR traffic.
- You are responsible for terrain and obstruction avoidance.

Lt. Walker is the aviation safety officer for VT 28.

. . . "one minute could be the difference between life and death for an injured crew member . . . suffocating in his own mask" . . .

Making a Hazard Known

The Bottom Line

By LCdr. David M. Kennedy

THE Navy oxygen mask (MBU-12/P NSN 1660-01-073-7595LS) will suffocate an unconscious or incapacitated pilot upon depletion of the emergency oxygen bottle when used with the standard Navy miniregulator. When properly fitted, the seal is airtight, and no provision allows for inhalation of ambient air if oxygen supply is cut off.

The emergency oxygen ("bailout") bottle, as installed in the A-4 and A-7, provides four to 20 minutes (depending on altitude at ejection) of breathing oxygen following actuation or ejection.

A pilot ejecting at 10,000 feet AGL with a standard NES-12 parachute will descend at approximately 18 feet per second, resulting in total time between ejection and landing of approximately 10 minutes. Simple subtraction shows that we have a potential hazard with the current system.

Not that *this* "concerned aviator" claims any credit for identifying the problem, mind you. Lt. Kevin Hutchison of VA 27 addressed the subject in his October '84 Approach article "So . . . How Do You Like It So Far?" Lt. Hutchison, an experienced parachutist, had been knocked unconcious by the ground parachute landing fall after he ejected from a TA-7C on FAM 1. He had taken his mask off during descent, but reflected that "one minute could be the difference between life and death for an injured crew member . . . suffocating in his own mask."

OK, I *know* that all safety equipment designs are compromises. Many considerations and tough decisions must be made in the design of *any* system. For example, the benefits of automatic LPA inflation (FLU-8 mod) were felt to outweigh the disadvantages the system poses for ditching and underwater egress, and experience has shown it to be a lifesaver. Sure, the current mask and regulator used in the A-4 and A-7 series aircraft provided for underwater breathing (one scenario), but they don't account for another scenario that recent experience indicates may be much more probable — a pilot who is unconcious or incapacitated and who can't remove his mask following ejection.

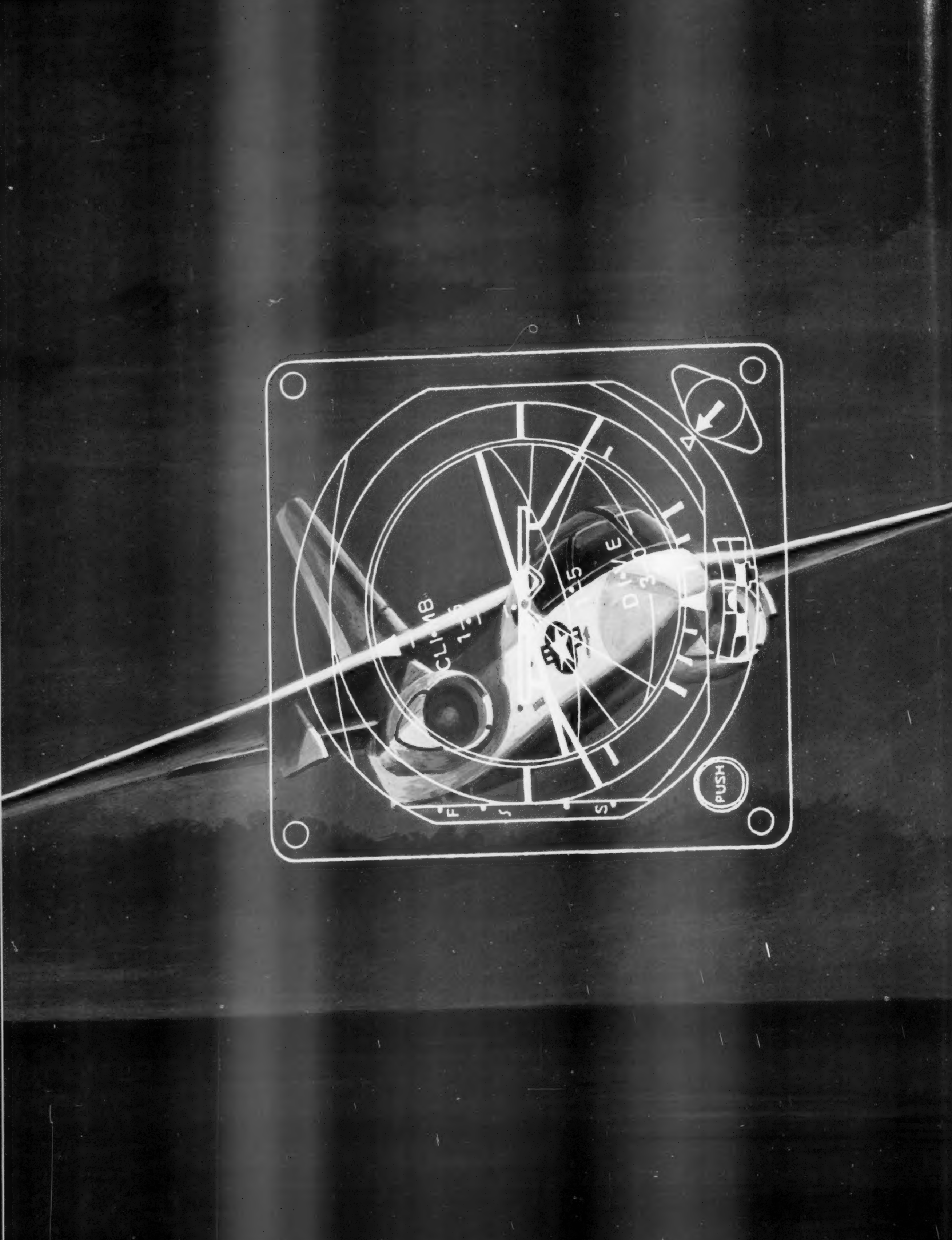
Do we really have to risk suffocating unconcious aviators in order to retain underwater breathing capability? Or are we dealing instead with a design oversight that our survival equipment experts can remedy, given the direction and mandate to do so?

In the meantime, all aviators who fly with oxygen masks and miniregulators should be keenly aware of this potential hazard. Bottom line. ◄

PRCM D.B. Leighton, a life support equipment analyst in the Safety Center's Aircraft Maintenance and Material Division, offered the following comment on this article: "Once again the axiom of the Training Command and aviation physiology training units comes into play. "IROK" — inflate your life preserver; remove your oxygen mask, or if over land, remove the hose from the mask but leave the mask in place to reduce the risk of facial injuries; options, gloves off, visor up, etc.; and Koch fittings.

One final thought concerning this article, a run of ejection statistics concerning the altitude at which ejections have occurred over the past 10 years shows that the mean or average altitude of ejections occur at 1,000 feet. I am not saying that there should be no concern about this problem, but our stats have shown that there have been no reports or problems encountered with this system to date."

LCdr. Kennedy is a graduate of the U.S. Navy Test Pilot School at NAS Patuxent River, Md., and is currently assigned to the Strike Aircraft Test Directorate at Patuxent. Earlier he served with HSL 33 at NAS North Island. Following jet transition at NAS Kingsville, Texas and A-7E replacement training, he was assigned to Attack Squadron 27, NAS Lemoore, Calif.


PUSH

Things That Go Tumbling in the Night

By Lt. George Clifton

I was the COTAC (NFO co-pilot of an S-3A Viking) for a routine night SSC hop during carrier air wing workups. Everything went smoothly during brief, preflight and start and, as usual, got a bit rushed as we approached the CAT. A Viking crew has a lot to accomplish once the wings are spread. The goal is to complete in one minute: flaps . . . speed brake checks . . . heading sources synchronized . . . takeoff checks . . . Ready to go. (Of course, the wing spread signal was not given until the last possible moment adding a bit of "hurry factor" to the night launch.)

With numerous carrier sorties under my belt, I could complete this routine without letting my pulse rise more than a few beats. Tapes, gauges, caution and advisory lights were checked at full power, the controls were wiped out and the pilot switched on the lights.

I always love the feeling of sudden acceleration from a catapult launch, but I don't let it distract me from the task at hand — to back up every action of the pilot to ensure we get safely airborne. I called off the end speed of 120 knots and watched as the pilot rotated to a good climbing attitude. Satisfied that we were safely airborne, I reached up to engage the yaw damper when the pilot said in a surprisingly calm voice, "Hey, my VDI popped out!"

Sure enough, there he was struggling with the VDI (vertical direction indicator), a rather large and heavy instrument. The wheels in my head began racing. "This is a pretty critical phase of flight," I thought to myself. "I'd really like to stay away from the water."

I could see that he was holding the displaced gyro at such an angle that the aircraft looked nearly inverted. Would he believe the VDI or would he believe his standby gyro, one of the smallest and notoriously most dimly lit instruments on his panel? I looked back at my own VDI and saw him rolling to the right about 15 degrees. I called out "you're rolling right, roll back to the left . . . that's good there."

We regained the wings-level attitude. Double checking the rate of climb, I was relieved to see we were still climbing. Meanwhile, the pilot had somehow managed to bring up the gear landing handle with his forearm and was stuffing the wayward VDI back in its appointed place. I called out, "150 knots, hold flaps until 180." He acknowledged and finally got the instrument installed and realigned in time for me to call "arcing" to departure who had been frantically calling us during the entire episode.

As one might suspect, this was a powerful learning experience. We know what caused this incident. We know what prevented it from causing the loss of four lives and an airplane. We think we know how to prevent it from happening again. It was caused by unintentionally short cutting proper maintenance procedures. There were four screws installed in the VDI. **Only one of them was the correct screw for that particular installation.** It had held just fine through previous cat shots as well as when the pilot pulled on the instrument during his preflight checks. That single screw decided to give up its grip on a night when it was needed the most. Close scrutiny (or "screwtiny") of every screw and testing for tightness of each with a screwdriver could have revealed the problem before flight, but such action surely exceeds the limits of a thorough, reasonable preflight.

What prevented this incident from becoming a catastrophe? It was good headwork and adherence to proper standard operating procedures. Had I seen us in extremis, I could have tried to fly the aircraft from the right seat (which isn't my job as an NFO), but I never saw us in that position. I recalled my unusual attitude training from the RAG and training command and was able to talk the pilot into a wings-level attitude. But even prior to manning up, the crew checked and doubled checked the aircraft weight and balance, accounting for center of gravity changes due to fuel and stores and calculating any assymetric loads on the airplane pitch and roll. Trim settings were calculated and verified so that the airplane should have virtually flown itself off the cat in a reasonable climbing attitude. Had this not been done, I might have seen us in a sinking, rolling attitude which could have required ejection. There really isn't much time to make that kind of decision off the cat.

Obviously, this incident could have been prevented by simple good housekeeping procedures down in the shops and attention to detail on the flight deck. Maintenance personnel should always realize that what might seem trivial and unimportant sitting on the deck can rapidly become critical in the world of turning jet engines, high speed, high G's and high altitudes. Keep those screws and fasteners meticulously sorted out, and make sure the right screw gets put in the right hole every time.

Another good lesson this article brings out is to always aviate first. Sort out exterior communications after you've gotten a handle on the emergency. — Ed.

Lt. Clifton is an NFO co-pilot (COTAC) on an S-3A Viking with Air Anti-Subron 32, operating off the USS *America* (CV 66).

. . . The airplane came out of the clouds in a slight nose-down attitude with a considerable rate of descent, which was arrested just inches above the water! Both pilot and co-pilot distinctly remember being able to see the barbs on a barbed wire fence extending out into the shallow water as the airplane bottomed out. . .

"That was barbed wire we just flew by!"

By Lcdr. G.R. Murchison

THE pilot in command was a very senior naval aviator with thousands of hours in type. The co-pilot was a second tour naval aviator with plenty of experience, but new to the aircraft in question. They departed home plate on a two-leg cross-country to NAS West for two days of conferences with a Friday afternoon return scheduled. The co-pilot, who was in the process of qualifying in the aircraft, got into the NATOPS and did the planning for the whole trip.

The trip to NAS West was uneventful in beautiful weather. The pilot-in-command let the co-pilot do most of the flying from the back seat so he could get a feel for the airplane. The co-pilot made a point of verifying the climb rates, cruising speeds, fuel consumption, descent distances and handling characteristics, etc., that he'd been studying in NATOPS. The fun began on the trip home.

A review of the winds aloft forecast and the very high altitude performance indicated a one-leg flight would be feasible *in good weather*, but the weather forecast for home plate was for 800-foot ceilings with three miles visibility. The co-pilot advised the pilot-in-command that the fuel computations did not meet NATOPS requirements with the existing forecast and that he felt a fuel stop was necessary. The pilot-in-command opined that the weather at home plate would probably get better, good alternate fields were nearby, the

winds aloft would probably be at least as high a tailwind as forecast and that he could get better gas mileage out of the airplane than the book indicated. The co-pilot voiced his reservations and again recommended a fuel stop; the pilots finally agreed on a target fuel overhead halfway airport and a minimum acceptable weather at home plate of 500 and 1. If either the target fuel or the minimum weather was not met, a fuel stop short of home plate would be made.

After level off at FL390, the co-pilot was relieved to see that the old hand in front was indeed right. The winds aloft gave them a tailwind of just over 120 knots, and the airplane *could* beat the book a little on gas mileage if handled just right. It would be no problem to be above target fuel at halfway airport. Still, there was the weather to consider.

A check with metro at halfway showed home plate to be 300 overcast, visibility one mile in light rain. The co-pilot recommended to the pilot that even though target fuel had been met, since the agreed upon weather minimums had not, a fuel stop should be made as planned. The pilot in command reminded the co-pilot that there were plenty of other suitable fields available before getting to home plate and made the decision to press on.

The co-pilot was a bit uneasy with this decision but comforted himself that he was flying with one of the most experienced aviators in the Navy; they also had a little more gas than planned and the weather wasn't really all that bad and, of course, he didn't want to look bad in the eyes of the old salt who incidentally wrote his fitrep. After all, if push came to shove, he could make sure of a good approach himself with a little coaching from the front seat, right? And so our heros pressed on for home plate, a hot supper and an early evening with the family.

It's amazing how the powers that govern the laws of aviation always seem to save special surprises for those who dare shave the margin. This crew had given away their options when they left halfway and headed on for home plate. Sure, there were plenty of suitable fields in the area, but it turned out that the best weather was at home plate, and that wasn't overly wonderful. If only they'd known what tricks the gremlins had up their sleeves. . .

About 100 miles from home plate, center advised that radar contact was lost and requested an ident. Several repeated tries and three squawk changes later it was apparent that the transponder had died. Just a minor irritation. A TACAN approach to a GCA final was still a perfectly good option. It would only cost a couple of hundred pounds over an en-route descent, and they'd made that up on the way. They'd still be able to land with planned fuel.

Descending through 20,000 feet for the TACAN initial, the TACAN needle began to spin, followed shortly by the loss of DME. A quick check of local TACANs showed it to be an airplane and not a ground equipment problem. The pilot advised approach control that due to a TACAN failure, he was transitioning to the overhead ADF approach (there goes another 200 pounds) and of his estimated position. The situation now was beginning to get a little tight. With only an ADF the likelihood of shooting a successful approach in the existing weather was less than optimum. And the weather at *all* fields within range that even had an ADF approach was below ADF minimums, including home plate. The pilot made the decision to stick with home plate and hope for a skin paint radar contact from approach.

On the outbound leg of the approach a most welcome "I have a skin paint heading 150 . . . now in a left turn" came over the radio. "Roger, that's us" from the pilot brought prompt and accurate radar vectors to final from approach followed by a very nice GCA. Breaking out under the overcast with the runway in sight the following call came from approach: "100, tower clearance not received, wave-off straight ahead, stand by for approach this frequency." The co-pilot immediately scanned the runway and adjacent taxiways and said to the pilot "Sir, the runway is clear, I recommend we land now." (Post-flight investigation revealed that the reason landing clearance had not been received on the first approach was that the tower watch had been less than alert and had missed the request for clearance from approach. There was, in fact, no conflict.) The pilot elected to take it around just in case there was some unseen conflict.

Fuel was now becoming a real factor. As the aircraft entered the clouds on missed approach, the pilot advised the controller he wanted an "emergency fuel approach." The controller brought the airplane around the pattern for an abbreviated approach that ended up high, fast and lined up well left of centerline — too high and too fast and too far left to land.

By now the situation was getting tense in the cockpit. The pilot decided to try a circling approach under the overcast, but lost sight of the runway and once again ended up in a position from which a landing could not be made. The pilot elected to try a 90/270 maneuver to make a downwind landing on the duty runway. About 180 degrees through the 270-degree turn the pilot went outside the cockpit to look for the runway, and the co-pilot noticed the aircraft rolling rapidly toward the inverted with the nose falling through. The co-pilot slammed the throttle to MRT, yelled "I've got it" over the ICS, leveled the wings on the instruments and pulled to just below stall angle of attack. The airplane came out of the clouds in a slight nose-down attitude with a considerable rate of descent, which was arrested just inches above the water! Both pilot and co-pilot distinctly remember being able to see the barbs on a barbed wire fence extending out into the shallow water as the airplane bottomed out.

This brush with death had a marked calming effect in the cockpit. A flawless instrument 360-degree turn was executed just below the overcast and a final landing made downwind (winds were only 3 knots) on the duty runway. The crew shut down in the line with 400 pounds indicated on the fuel gauge and went home a whole lot wiser. ◄

Lcdr. Murchison is assigned to VA-27, an A-7 squadron based at NAS Lemoore, Calif.

Where Did All That Blue Sky Go?

By LCdr. Dan Mazzeo

THE first time I really noticed blue sky missing was as an eager naval flight student. Since I was new to the flying business, the Navy provided me and my fellow student naval aviators with a rotating beacon to announce when in fact the sky was blue. First light every morning found us religiously facing the beacon to see if it was a day of flight or one of emergency procedure study. The beacon, if on and rotating, heralded missing blue sky, off it proclaimed launch all student pilots. "Off" it was, and shortly thereafter, so was my T-34 on a solo acrobatic flight. Then it happened, a thick fog formed and the sacred rotating beacon couldn't even be seen. This divert was uneventful except for the lesson learned about dew point spread and light winds.

Another occasion occurred on a clear summer day off the West Coast as I was wrapping up a "respectful controlled crash" carrier qualification period when "we" (i.e., the ship's captain and air ops) decided to squeeze one more pass from my thirsty A-4. The weather in and around San Diego was to be clear all day enabling us to take it down to BINGO while harboring a good warm puppy-dog feeling inside. Foul deck, wave-off and you guessed it, ". . . your signal is BINGO." Not to worry, good looking sailboats playing in the sea below and blue sky above. Then it happened. Somewhere during the descent for final approach I misplaced the clear blue sky. The ensuring landing at field minimums was uneventful except for the lessons learned about smog, haze and the fact that you never have too much fuel in a flying machine unless you're on fire. It happened yet again in "Thunderstorm Alley" just off the East Coast while I was flying a T-28 from Jacksonville to Washington D.C. The entire blue sky disappeared behind a line of massive thunder cells. An instrument rating was not a free ticket for a ride through this mess. This rock and roll dance with a thunder cell was uneventful except for the lessons learned about the effects of baseball size hail on 2024 aluminum skin and, yes, I'm convinced a VSI can be pegged 6,000 fpm up and 6,000 fpm down at the same time.

Flight time in actual instrument conditions during alleged VMC continued to accumulate and soon the Navy requirements were fulfilled for a special instrument rating. By this time you have demonstrated through your mature judgment that you know better than to take off in zero visibility, zero ceiling conditions, but if you did not know better, you are now allowed legally to go for it. I was in a Sabreliner ready for IFR departure, ceiling zero, visibility zero, takeoff alternate reported clear and seven. I viewed and reviewed the weather charts, briefed with the expert weather forecaster, listened to PIREPs, and even peered out the window to see what the weather **really** was like. Off we went and, shortly thereafter, off went a recently replaced engine oil plug and on came the low oil light, followed by zero oil pressure and engine secure during the climb. It was an uneventful two-hour flight on one engine before we could find weather even close to the blue sky promised but missing from the takeoff alternate 20 minutes away. I learned a lot about "necessity of flight" and promises from the weather person that day.

The Eastern Med was blue, whether looking down from the carrier flight deck or looking up. Aviating around the clock for several months in the same airspace tends to give you the same degree of confidence as predicting the weather in your bedroom. It was to be just another EA-6B twilight cat shot and night recovery from conditions ideal for stargazing. Shortly after launch I was level at 25,000 feet watching the sun set somewhere beyond Cyprus when what appeared to be Lubbock, Texas, approached from the southwest. Actually, the appearance of the air below took on the reddish brown hue I last remember seeing flying over that city during a dust storm some years ago. The ship was advised, but of course they also

knew that the night was to be clear, it had always been clear. It was an "uneventful" IMC approach through a North African sandstorm that night to a small steel deck floating 60 feet above the sea that provided some inspiration for thought. Yes, a well-trained instrument pilot can fly a manual approach to a successful arrestment in such conditions, but a better trained instrument pilot should not allow such a situation to fully develop. I learned to be more aggressive in reporting unexpected weather conditions encountered in flight; to not be complacent even on the most routine of flights; to not push an approach into marginal conditions when, everything else being equal, there is a suitable alternate available; and above all else, to maintain personal flying proficiency at the highest possible level.

LCdr. Mazzeo has accumulated over 4,500 flight hours in numerous aircraft including high performance tactical carrier aircraft, multiengine transports, as well as light singles and twins. He has a BS degree in aerospace engineering and designation as an aviation safety officer from the Naval Postgraduate School. He is aviation safety officer at NAS Pensacola, Fla.

Nothing in the Book

By LCdr. Steve Hissem

I'LL call my nugget pilot "Joe." We were taking a four-plane division out for initial night tanking quals. It was a difficult evolution for most replacement pilots, but I felt well-prepared for whatever problems we might face.

Before the flight, Joe admitted that he wouldn't mind if our hop was cancelled, but I figured that was because it was a night hop and not an easy mission. The brief was thorough, since this was to be these pilots' first night tanking mission and the weather was briefed to be solid from 1,500 to 10,000 feet. Joe was quiet during the brief and appeared a little tired but I didn't think anything of it at the time.

We manned aircraft 202 and, due to the weather, launched as a single. Soon after takeoff, we went into the overcast and did not break out until above 10,000 feet.

Once on top, we quickly spotted the tanker and the covey of lights around him which belonged to our wingmen. It was just as we started to join up that things began to go wrong. Initially, the rendezvous stalled at about three-fourths of a mile. I thought that Joe was merely being sloppy, so I called for him to join up properly and to be quick about it, so that we would not look bad in front of the rest of the flight. He made no reply, but we did start to join up again. Soon after that, however, the aircraft began to slip back out of position and to lose altitude. By now I wasn't sure whether to be mad about Joe's poor performance or worried that something serious was wrong.

I asked Joe what the problem was but there was still no answer. Thinking that Joe had lost communications, I took my mask off to try shouting at him to get his attention. Once my mask was off, there was no mistaking by the odor that Joe was seriously ill and vomiting. Our plane was continuing to slide aft and down and was beginning to pick up a roll to the left. The thick undercast was ominously close now. If something wasn't done soon, we would be in the clag. I was sure that in Joe's condition he couldn't handle instrument flight.

At first Joe did not respond to my calls to roll right and climb, but shortly afterwards the sink rate began to slow and the ominous roll to the left was corrected. For a time we did nothing more. The immediate danger was over and I was now concerned about whether Joe was picking up any vertigo. The sequence of steps we would have to follow became clear now and I finally began to get ahead of the plane. It was now very obvious to our wingmen that something was wrong in aircraft 202 and they all began questioning us over the UHF. To clear the radios I gave our lead a quick report on our status and asked him to inform approach and home plate of our emergency.

With time now on our side, I tried to find out whether Joe was going to be able to shoot the involved IFR approach that we had ahead of us. After we had maintained level flight for awhile I requested a standard rate turn left and then another to the right. Joe was starting to answer me now and said that he was feeling better and felt able to try the approach. With some trepidation I called our controllers and asked for flight following through the undercast.

Joe and I discussed the descent and decided to avoid any turns while popeye to lower the chances of getting disoriented. I was still worried that Joe would get sick again. Once established on heading, wings level, Joe started a slow descent and we entered the undercast.

It's safe to say that this was the longest descent in my career. I kept talking to Joe to make certain I knew how he was doing. He wasn't talking back very much, but the aircraft was responding. Eventually we broke out at 1,500 feet and got a hand off to approach. Our lead had already contacted them so they understood our problem and gave us vectors to final approach.

Attempting to simplify the landing sequence for Joe, I requested an arrestment and told approach that we would like an LSO on station if he was available. He wasn't able to get to the runway by the time we wanted to land and, still afraid that Joe would get sick again, we elected to land immediately. Things were going well now, which only heightened my sense of foreboding. However, things don't always go from bad to worse and our approach and arrestment went off without a problem.

Medical finally determined that Joe was suffering from food poisoning contracted from a sandwich he bought from the squadron mess.

We learned that night that not all the emergencies are in the book, but that the first step in any emergency is to aviate.◄

LCdr. Hissem completed his first fleet tour as an F-4 RIO with VF 161. After a tour as a RAG instructor with VF 171 he joined VF 21. With the FREELANCERS he transitioned to the F-14 and recently completed a Western Pacific/Indian Ocean deployment aboard USS *Constellation* (CV 64). He is currently assigned to VF 126.

Wind shear and thunderstorms?

Helos don't fly in that stuff!

By Lt. D.M. Armstrong

SOUND FAMILIAR? I used to think it was true, especially while in the training command. I was lulled even further during all those cushy training hops off the SOCAL coast. Sigh! Hopeful Nugget! A perfect example of how wrong I could be happened during a "gedunk" run from CV Rising Sun to MCAS Far East.

It was a 0530 go, a few pax to drop off at a small boy, several more to drop off on the beach and several to bring back to the CV. We had time to shut down and have breakfast because our overhead wasn't until 1330. Great, no sweat! The weather wasn't bad, a few scattered rain showers, good visibility, and about 20 knots of wind. Inbound the flight was no problem; we even stopped for breakfast as planned. Preparation for the return trip was uneventful. After receiving our weather brief, we preflighted and manned up for our 110-mile transit home. The weather was forecast to be 1,000 feet broken, with winds of about 20 knots. I inquired about thunderstorms to the northwest, our intended path; the weather forecaster said there were no thunderstorms in that area.

The sun was actually breaking through in spots as we departed. About 20 minutes out we picked up USS Small Boy on the TACAN and contacted them for "pigeons" to "mother." We were 70 miles from the small boy and 20 more after that to mother. No problem, we had a "full bag and a full belly." Cruising along at 1,500 feet and 90 knots, we noticed the weather was coming down a little and we were passing through and around some rain showers.

About 50 miles from "mother," we noticed the weather was now a solid overcast of grey-black clouds with about 30 knots of wind. There were scattered clear spots rather than scattered rain showers with quite a bit more turbulence than anticipated in our weather brief. After passing USS Small Boy, we contacted Strike to let them know we were inbound.

The ship was in the middle of a fixed-wing recovery and the weather at this point was about 800 feet overcast in heavy rain showers, with 30 knots of wind. Proceeding inbound, our visibility was reduced to zero due to the heavy rain showers. We were tasked to do surface search on our inbound vector. Due to our reduced forward visibility, we chose 600 feet and 90 knots to avoid entangling ourselves with the small boy escorts in our vicinity.

We used our crewman for "surface search," (peering out the cargo door). While in the gunners belt they could see much more than we could. At 090/13 nm from "mother," flying at the base of the cloud layer, we flew into what I now believe was a severe wind shear. At 600 feet/90 knots wings level our helo *instantly* went into a 30-degree AOB right turn and descended to 130 feet/55 knots. Needless to say we were both on the controls and finally pulled out of the attitude and leveled off at 130 feet. The upper half of our personnel door had been torn off, but everything else seemed useable. Our crewmen had been tossed about the after station, secured only by their gunners belts. The second crewman flew up and hit his head on the overhead. The first crewman hit the deck and held on.

Until we pulled out there was a total lack of control effectiveness. They just didn't seem to respond. Talk about horrifying! The engines, I would have sworn, had flamed out, but after a double-take, appeared to be operating normally. After regaining our composure we proceeded inbound at 150 feet/60 knots and opted for a visual approach. There was no way I wanted to go popeye, or climb through the "twilight zone" at 600 feet. Picking up the ship at a half-mile using TACAN and radar vectors, our landing was as uneventful as it can be. . . in 60 knots of wind.

Lessons Learned. — Take your weather brief seriously but remember that it's only a forecast. The old adage applies "prepare for the worst, hope for the best."

— Think about your course of action if something falls off, or is ripped off, your aircraft. You don't have to just survive the worst part of a thunderstorm; you have to survive the total damage done by the storm. Our personnel door flew off after we leveled off at 130 feet. I heard a very loud noise behind me and turned to see our door sucked away from the aircraft as if it was going to the land of Oz. What if it had been sucked into the land of tail rotors?

— Most of all I learned that "helos *do* fly in thunderstorms and wind shear conditions"; especially in the CV environment. Helos are the first off and the last on deck. Our fixed-wing brothers fly in these conditions, and (obviously) so do we. Be prepared! ◄

Lt. Armstrong serves with HS 12.

Bird Strike at the Hold Short Position

By Capt. R.D. Craig, USMC

IN my relatively brief aviation career of six years I have never heard of a bird strike like the one I'm about to describe.

After a successful three-week exercise in the desert, my wingman and I manned our A-4Ms and were eagerly looking forward to our return to MCAS El Toro.

While awaiting takeoff clearance at the hold short position at Twentynine Palms, a flock of five white egrets began desperately circling my wingman's aircraft. The egrets were seeking refuge from a lone hawk. Seeing my wingman's aircraft as the only shelter within reach and disregarding the noise from our turning engines, the egrets landed on the avionics hump of his aircraft.

I was shocked. I had never seen or even heard of birds landing on a turning jet aircraft, but here was a flock. I watched with amazement.

The egrets were uncomfortable, possibly because of the noise. They attempted an escape but were quickly grounded again by the more maneuverable and better armed hawk. This time they landed on the nose of my wingman's aircraft. My wingman and one egret were actually beak to beak staring at each other through the windscreen. As my wingman was about to shut down, two squadron personnel ran to his assistance and chased the birds away with the hawk giving pursuit.

After an uneventful two-hour flight back to MCAS El Toro, the remains of a white egret were discovered in my intake. At no time did I observe any of the birds around my aircraft, but yet there it was. Obviously, while I was busy watching my wingman's predicament, one of the egrets, ignoring the danger markings, sought the safety of my intake.

Luckily, no damage was done to the aircraft, the engine or me but, of course, the bird was beyond repair.

Looking back at the incident, my course of action would be completely different were it to happen again. As soon as the birds posed a threat, I should have shut down or taxied back to my line and had the intakes inspected. What turned out to be a lucky day could have been a disaster. ◄

Capt. Craig is currently an advanced phase instructor flying the TA-4J Skyhawk, having flown the A-4M in the fleet.

Enter The Dragon

By CWO4 Bob Henderson

In days of old, silver-suited knights, proudly displaying the colors of their fair maidens, would venture forth on their trusty steeds to slay the evil, fire-breathing dragon. Of course, today we recognize these ancient tales of heroic, chivalrous deeds as myths — stories which add to the excitement of childhood fantasies. With today's wonderous technological advances such as space shuttles, artificial hearts and even the computerized coloring of old black and white John Wayne movies, who has time to think about dragons? Kid stuff, right? Think again, exhaust breath! They may have taken on new forms, but the dangers have not changed. Our modern beasts are called Tomcat, Hornet, Intruder, Corsair, Sea Stallion and Harrier.

Unlike his predecessors, this new dragon can become exceedingly more dangerous, depending on his liquid diet. He normally drinks JP-5 and, although dangerous, remains controllable. Occasionally, however, he has the opportunity to stray from home and partake of shore-based moonshine — JP-4. When this happens, he becomes extremely volatile and unpredictable.

A JP-4/JP-5 fuel mixture with as little as 5 percent JP-4 lowers the flashpoint of that mixture from 140 degrees Fahrenheit to about 80 degrees Fahrenheit. This substantial change creates a real danger. In recent months there have been no fewer than four reports of fires caused by aircraft dripping a JP-4/JP-5 mixture onto a parking ramp where temperatures reach 120+ degrees Fahrenheit. The hot concrete became the ignition source. The possibility of this mixture being introduced to the shipboard environment is even more frightening. It is absolutely critical that we all recognize the danger and prepare in advance to deal with it effectively. The aircraft handling officer (ACHO) must take the initiative to minimize the possibility of a catastrophe.

NOTE

THERE IS NO EXTINGUISHING AGENT IN USE TODAY WHICH CAN EFFECTIVELY EXTINGUISH A RUNNING JP-4 FUEL FIRE!

Recommended DOs and DON'Ts:

DO:

- Brief all squadron personnel that the air boss and the ACHO must be notified if any aircraft has taken on JP-4 during the last five top-offs. This includes fuel taken from "pre-mix" trucks or "Jet A-1" sources.
- Brief the Air Bos'n or crash crew supervisor to ensure the aircraft is checked periodically.

DON'T:

- Don't allow an aircraft to be defueled into a JP-5 stowage tank, until a flashpoint test has been conducted and a reading of at least 136 degrees Fahrenheit is obtained. Fuel having a flash point lower than 136 degrees Fahrenheit cannot be introduced into the ship's JP-5 fuel system.
- Don't spot an aircraft with a known JP-4/JP-5 mix over a catapult track.
- Don't spot an aircraft with a known JP-4/JP-5 mix on or near the foul line, if at all possible.
- Don't allow an aircraft with a known JP-4/JP-5 mix to be sent to the hangar deck unless absolutely necessary, and only then after the approval of the commanding officer and notification of the hangar deck officer and the damage control assistant (DCA). ◄

ABOVE ALL — DON'T LET THE DRAGON SMOKE YOUR SIX.

CWO4 Henderson is an Air Bos'n who has served on all classes of aviation ships. He was the flight deck bos'n aboard USS *Nimitz* (CVN 68) at the time of the catastrophic EA-6B crash in May 1981. He is currently the shipboard aircraft firefighting coordinator for Naval Air Systems Command.

Ball, Ball, Ball

By Capt. John Zerr

WE have been landing airplanes on carriers for a good many years, and you would expect there to be general agreement among aviators about basic ball flying techniques. If you think that, you'd be wrong. Following a recent carrier landing mishap, I discovered there were two separate bodies of opinion regarding "the right way" to fly the ball. One group holds that your basic ball flying scan, "meatball, lineup, angle of attack" remains the same throughout the approach. This first group considers it advisable to increase emphasis on scanning the ball from "in close" to touchdown but to continue to scan lineup especially and angle of attack as well.

The second group maintains that during the early stages of an approach, the scan is indeed "meatball, lineup, angle of attack;" however at the "in close" or " at the ramp" position, the scan changes to "ball, ball, ball." Some proponents of this technique considered it to be wrong to look at the deck at all beyond the "in close" position since this constitutes deck spotting.

The carrier landing mishap in question involved an aircraft shooting a night approach to a ship under difficult conditions. The ship was constrained by sea room, restricted airspace, surface traffic and the tactical situation. Because of these conditions, the ship elected to effect a downwind recovery. As a result, there were following seas, which gave the helmsman difficulty.

Through much of the approach, there was a star or planet visible in the plat tape. It was therefore possible to get a quantitative handle on lateral ship motion. Throughout the approach, the aircraft chased lineup, but all lineup deviations appeared to be caused by lateral ship motion and the pilot appeared to be making proper lineup corrections. Although the pilot was never really stabilized on centerline, he was working lineup all the way in response to lateral ship motion. At about three to four seconds prior to touchdown, the aircraft was lined up briefly, but then a right drift began which the pilot did not counter. At about 1.5 to 2 seconds prior to touchdown, the LSO gave a "come left" call which the pilot did not hear. The mishap aircraft landed right, and its wingtip hit the radome of an aircraft parked inside the foul line.

The mishap pilot was a first cruise pilot, recently reported from the RAG. He was considered to be a good ball flier. He and his NFO had developed a procedure where the NFO challenged the pilot to check lineup as they crossed the ramp. Following the lineup call, or when the pilot considered himself to have crossed the ramp, the pilot shifted his scan exclusively to the lens. Review of that plat tape yielded these observations:

(1) For about 10 seconds prior to the mishap, the ship was in a steady turn.

(2) The mishap pilot successfully tracked the turn, as he had previous lateral deck motions, until about 3.5 seconds prior to touchdown, at which time he appeared to stop flying lineup. This also agreed with the pilot's statement as to the ball scan technique he employed (BALL, BALL, BALL).

The pilot stated he was totally surprised to find he had landed right. His "BALL, BALL, BALL" technique and exclusive focus on the lens were so intense that he was oblivious to the fact that lineup was slipping dangerously away from him.

Two "by-the-way" observations seem appropriate here. Had the star not been visible, the mishap most certainly would have been chalked up as "a clear case of pilot error." Only through analysis of the apparent motion of the star on the plat tape was lateral ship motion and the turn observable. LSOs did not see it (try picking up lateral deck translations yourself some dark night before you conclude the LSOs should have).

Also, had the pilot responded to the LSO lineup call (the mishap aircraft would most likely still have hit the aircraft within the foul line) the mishap would very likely have been charged to the ship for turning, and the board might never have delved into background matters so deeply. Therefore, what we have here is a unique opportunity to learn a very valuable lesson.

It appears there were a significant number of pilots who believe in the "BALL, BALL, BALL" scan technique. It also appears there are some LSOs who teach the technique.

Ships have always had, and probably always will have, problems with sea space, air space and surface traffic as well as following seas, cantankerous winds and crappy weather. Such problems invariably occur at the most inopportune times. Fleet carrier pilots must be able to land airplanes efficiently under lots of nasty conditions without smacking the ramp and without hitting airplanes parked on either side of the landing area. This sort of thing is absolutely essential if we are to consider ourselves a combat ready force. The opportunity to engage the enemy is bound to occur during the greatest possible accumulation of "dog growl" conditions. If we can't safely land our airplanes, we'll most likely do more damage to ourselves than the enemy ever could.

You can't hit the ramp, you have to get aboard, you can't spot the deck, and you have to land on speed and on centerline while the admiral, the captain, the commies and God are all conspiring to make it as tough as possible. Nobody said it was supposed to be easy. It is, in, fact pretty tough. It's what makes a naval aviator a unique animal. But until we start operating throw-away drones, carrier landing is our bread and butter. Also, we will continue to see a greatly increased emphasis placed on night work. I do not believe we can afford to continue to operate with a significant number of carrier aviators in the fleet who believe it is OK, or even desirable that they become oblivious to lineup during the final seconds of a carrier approach. As I see it, "BALL, BALL, BALL" is just plain "BULL, BULL, BULL."

I recommend that reps from the type and functional wings and the LSO school hold a joint conference on this subject, thoroughly flush out all the issues and ramifications, and issue a joint policy statement regarding "in close" ball scan.

Type commanders and the LSO community agree that meatball, lineup, angle of attack scan remains the same throughout the approach. There was a time when a technique was taught which changed this scan just prior to touchdown to "Ball only." This technique is no longer valid. If it is still being taught or practiced, it should be stopped. Additionally, the Bridge will notify air ops and prifly of all ship turns while at flight quarters. The air boss will pass ship turns to the LSO over the 5MC or prifly to LSO sound-powered phone circuit. Recommendations contained in this article have been passed along for action. — Cdr. D.L. Gracie, Head, Air Operations Branch, Naval Safety Center.

Capt. Zerr is the director of the Systems Engineering Management Division of Naval Air Systems Command in Washington, D.C. Prior to his current assignment, he was the commander of Carrier Air Wing 14 on board USS *Constellation* (CV 64).

Note:
Please be sure that crew members in Bravo Zulu photographs are shown conforming with NATOPS and that their flight suit sleeves are rolled down. We want you to look as professional as you really are.

Lt. Rick Roche
VT 23

Lt. Rick Roche, an instructor at VT 23, was conducting a field carrier landing practice (FCLP) flight in his T-2C at NAS Kingsville. On the first touch-and-go, he felt the right wing dip significantly. Countering with left stick and full power, he became airborne. Observing the right main landing gear assembly during climbout, Lt. Roche saw it dangling in the airstream, then separate from the aircraft, impact the right flap, and fall to the runway. He continued to climb and established an orbit overhead the field. Anticipating a possible hydraulic failure due to damaged lines, the controlling LSO and Lt. Roche complied with the NATOPS procedures for "one main gear hung." He raised the two remaining landing gear and preparations were made for a gear-up landing. Due to the probability of a hydraulic failure, he elected to land as soon as the arresting gear was derigged. He executed a minimum rate of descent, flared landing, securing both engines as soon as he felt the aircraft touch down on the runway. The aircraft skidded approximately 2,000 feet before coming to rest on the runway centerline. Post-landing inspection revealed minimal damage to the aircraft. Neither engine was fodded.

BRAVO ZULU

Lt. Pete Le Voci (left) LCdr. Scott Hendrickson (right).

LCdr. Scott Hendrickson
Lt. Pete LeVoci
HSL 32

LCdr. Hendrickson and Lt. LeVoci (co-pilot) were performing a functional check flight hover when they heard a loud bang. Severe vibrations began to jolt them violently against heir shoulder harness straps. Firmly gripping the controls, LCdr. Hendrickson, lowered the collective and landed the aircraft. When the vibrations continued unabated even though the aircraft was on the ground, Lt. LeVoci, secured both engines and firmly applied the rotor brake from across the cockpit. The vibrations continued until the main rotor blades stopped, with 'A' blade at the 10 o'clock position and only 4 feet off the ground.

During the shutdown, the 'A' blade droop stop had failed to seat properly. Any delay or slower application of the rotor brake would have resulted in the blade striking the tail pylon, severing the tail rotor drive shaft and causing major structural damage. Post-flight inspection of the main rotor system revealed that a main rotor blade spar had broken completely through at the point where it was connected to the lower end of the blade folding pin. Under dynamic loading, it would have taken only a few more seconds for the blade to have separated from the aircraft.

Outstanding crew coordination and rapid, professional response in a clutch situation allowed this crew to save an aircraft and avert disaster.

. . . The inadvertent wheels-up landing is certainly no respector of rank, age or experience. . . .

Look Ma! No Wheels

By R.A. Alkov, PhD.

"NAS West, Papa Golf 205 at the 180 for full stop, runway one niner." "Roger two zero five, extend your downwind for a light aircraft on a two-mile final." "You got him yet, Bill?" "Negative." "I've got him, start your turn onto final." "Gear down and locked, check brakes." The pilot-in-command (PIC) and flight engineer both checked brake pressure. (No one remembers checking the gear handle or landing gear indicators.) The pilot-under-instruction (PUI) felt uncomfortable about his nose attitude on final. He was making his 15th and final landing of the afternoon. It was to be a practice no-flap landing. The aircraft touched down at 2,730 feet on an 8,000-foot runway. Sparks flew as it scraped to a stop. Why had the crew forgotten to put down the rollers? Was it a lack of experience? The PIC was an O-5 with 2,206 hours in type, 5,283 total flight time. The PUI had 1,954 in type with 2,269 total hours.

An A-7E was launched as a mission tanker during carrier ops. The pilot was directed to lead an A-7 that was having radio problems to a night CV recovery. Following two wave-offs the NORDO A-7 was bingoed. The tanker dropped the NORDO wingman off on a straight-in for runway 6 at NAS South. With a feeling of great relief he raised his gear, but not his flaps, and turned on a wide downwind, dumping fuel. Distracted with picking out the runway lights which were hard to see due to the rocky terrain, the pilot called "Deep one eighty, three down and locked for a full stop." At touchdown the aircraft skidded on its belly, coming to rest six feet right of centerline, only 3 degrees off runway heading. The pilot, an O-5, had 1,822 hours in model with a total of 2,906 flight hours.

The inadvertent wheels-up landing is certainly no respector of rank, age or experience. The average time-in-type for the pilots involved in 29 inadvertent wheels-up landings, which have occurred in the Navy and Marine Corps during the past eight years, was 1,005 hours. Their average total lifetime flight experience was 2,587 hours. (Pilot data was not available on six incidents; in some cases damage was not severe enough to require a Flight Surgeon's Report.) Grade levels ranged from O-2 to O-5.

Although there are currently fewer than three such incidents per year, they can be quite expensive. In the first case described above, a P-3 was destroyed because of a post-crash fire. Certainly, no one wants to see the numbers go back to the 18 wheels-up landings per year naval aviation was experiencing 15 years ago.

Why do experienced aviators continue to make wheels-up landings? Why do they ignore warning horns and fail to notice gear indicators and lights? It is not enough to cite pilot error, poor judgment, lack of crew coordination and failure to complete the landing checklist as contributing causes. An

. . . At touchdown the aircraft skidded on its belly, coming to rest six feet right of centerline, only 3 degrees off runway heading. . . .

unintentional gear-up landing is, by definition, an error of omission on the part of the pilot. For some reason the pilot fails to activate his gear lever and fails to check that the wheels are in fact down prior to landing.

In almost every landing evolution the gear is lowered and the system works as advertised. There is a high concentration factor during a landing approach. Everybody wants to make a good landing and works hard at it. At this point any unusual distraction can break the habit pattern and cause a concentration overload which renders the pilot insensitive to such things as flashing lights and warning horns. He may even look at the gear indicator and "see" a wheels-down indication when it is not there. This is especially true if the pilot has been practicing a series of touch-and-go landings. Anyone fatigued can experience a lapse of attention. When coupled with seeing the indicators on landing after landing, a small distraction can lead anyone who is not vigilant into reporting the gear down when they aren't.

An analysis of the data on wheels-up landings for the past 15 years reveals that the typical scenario involves some kind of distraction, either from within the aircraft, or with another aircraft, during practice and real emergencies or with pilots concentrating on other traffic. There were almost as many single piloted as multicrewed aircraft involved. However, the A-7 has accounted for more than half of the inadvertent wheels-up landings that have occurred in single-crewed aircraft during this 15-year study. Six of these A-7 mishaps have happened in just the past five years! This indicates a possible systems design problem in the human engineering of the cockpit.

Discounting the A-7 then, the preponderance of gear-up landings have occurred in multicrewed aircraft. Rather than affording a pilot the advantage of having more than one pair of eyes and ears to detect warnings, it seems that additional crew members may add to the distraction in the cockpit or give a false sense of security.

Under conditions of high information overload there is a tendency for the unaided pilot to fail to process visual and/or auditory warning signals which under normal conditions are clearly discernible. There is a definite limit to the amount of information that a human operator can process in a given time. Human decision-making is sequential (one thing at a time) rather than parallel (several at once). A pilot's perception of sensory information may be seriously impaired in a developing emergency situation because his information processing capacity may be completely tied up in the cognitive process of identifying and implementing optimum procedures to counter an emergency.

Under conditions of divided attention such as this, information from warning lights and horns may not be processed at higher brain levels even though the senses are unimpaired. This "functional blindness" can occur among even an entire crew in a multicrew aircraft. One example of this occurred several years ago when the crew of an airliner, who were coping with a nose gear that wouldn't extend, allowed the aircraft to gradually lose altitude and fly into the ground.

Distraction is difficult to evaluate. The pilot who realizes he is distracted obviously is not yet overloaded and is probably still able to cope with the situation. A truly overloaded pilot is the last one to be able to evaluate his own condition since he is concentrating totally on flying the aircraft. The same concentration overload which sets the stage for wheels-up landings may also play a part in other pilot errors of omission. Pilots who land gear up often mention having had an uneasy feeling on the approach. This is a subconscious awareness that something is wrong. In a circumstance such as this a pilot should wave off, relax and look around the cockpit. To continue with such a feeling of something being wrong is asking for trouble.

In order to get the pilot's mental workload back to a manageable level he should:

- avoid large numbers of sequential touch-and-go landings.
- consider flying away from confusing operations and reenter when conditions improve.
- avoid indecision and never abort a wave-off decision.

In addition:

- tower personnel should be cautioned against distracting transmissions at the point where an aircraft is being configured for landing.
- an alert wheels watch should be maintained at all times during flight operations.

It used to be said that "There is them that has had 'em and there is them that's gonna have 'em" in aviation. Well, you don't have to have 'em at all if you maintain constant vigilance. A gear-up landing could spoil your whole day. Avoid the embarrassment a student aviator experienced several years ago when he landed his prop trainer gear up. The aircraft slid off the runway, hit a ditch and flipped over. As tower personnel watched in amazement, the gear doors on the bottom of the wing opened and the landing gear slowly rose to the vertical position! ◄

Dr. Alkov, a retired Naval Reserve aviator, is head of the Behavioral Sciences Branch, Aeromedical Division, Naval Safety Center, Norfolk, Va. He earned his PhD. from Florida State University and has been with the Center for 19 years, during which time he has written numerous articles for Approach.

LETTERS

Re: The Horse That Threw You (Oct '85)

Colorado Springs, Colo.— As an exchange officer flying with the Cadet Flying Training Squadron at the U.S. Air Force Academy, I was intrigued by Cdr. Place's article. Several months ago we had the pleasure to host Chaytor Mason, a renowned aviation safety authority and instructor, at a monthly safety presentation.

As a former Marine Corps aviator, he related a story about a post-WWII Corsair pilot who had the misfortune to land short and not only bend up his steed, but also severely bruise his ego. Not surprisingly, he was given a stern lecture and placed back in the saddle that same afternoon to regain lost confidence. As you might guess the results were *two* bent Corsairs and much consternation. His point was that we have known for a considerable amount of time that there are not only psychological but also physiological reasons why things like this occur.

If I interpret your editorial response to the article correctly, you are justifying this approach with a rationale akin to saying that your yearly flight physical certifies you "mission capable" for the next year. Once qualified does not mean there may not be times when recuperation from a malady is certainly proper. It seems only logical that if we are to ever get a handle on the last big hurdle in aviation safety, the multiple human factors in "pilot error," we must come to grips with problems such as this by putting away the old remedies and managing our most valuable resources in a more enlightened manner.

LCdr. Stephen G. Hagberg
Exchange Officer
U.S. Air Force Academy

Re: Adding Your Own Survival Gear — Editorial (Oct '85)

NAS Cecil Field, Fla. — Unauthorized modification of/or deviation from authorized configurations of personal issue government furnished equipment (flight gear) over the past few years has been a constant source of friction between the aircrew survival equipmentman and the aviators we service. Often our vested interest in their well-being and safety is viewed as meddling or blind obedience to a set of rules and regulations which do not take individual needs into account. As the wing rigger, my major concerns are all factors which affect the safety and comfort of all *my* assigned aircrews. This includes ensuring required inspections are performed by the aircrew survival equipmentmen and making sure that all aviators' equipment is in top condition for that "one time use." By top condition I mean no unauthorized modifications.

Why do aviators persist in trying to beat the system with regard to their flight gear? The current system treats flight gear like aircraft parts because this equipment is only on temporary loan to the aviator while on duty involving flying status (DIFOP) orders. This equipment is maintained, updated and serviced by the system at no expense to the aviator by both "I" and "O" level PRs, in a manner similar to those services provided by other "I" and "O" level technicians to aircraft/aircraft parts owned by the system. The aviator's personal and individual needs (within limits) are recognized by both the OPNAVINST 4790.2 series and NA13-1-6 series manuals. The NA13-1-6.7 permits the aviator to add up to 5 pounds of additional survival equipment of his own choosing to the existing list of required items (this limit is imposed OPNAVINST 4790.2 Manual grants authority to activities to modify one aircraft/unit for experimental purposes if the ACC/TYCOM approve, pending formal NAVAIR concurrence.

As a user (tour in Southeast Asia as search and rescue aircrewman (wet crew)), the equipment I was provided fitted the demands of my environment very adequately, and I was not prompted to perform any unauthorized improvisational modifications in order to accomplish my mission. However, if an aviator through foresight and initiative develops a new piece of survival equipment or improves an existing item which could benefit the aviation community, I would be remiss in the performance of my duty if I didn't provide his/her idea my strongest support up through the chain of command.

The Aircrew Survival Safety Board with its Flag Level Steering Committee should remove any existing doubt about system responsiveness and concern for the health and safety of fleet aviators.

Personally, as I have for the past 20 years, I will continue to educate the fleet aviator and assist in making intelligent and safe deviations from authorized configurations.

PRCM (AC) R.P. (Rick) James
Light Attack Wing ONE

"Frankly, I Feel Like Hell"

FPO Seattle— A man died today. In the local U.S. Naval Hospital, far from his home shores, a 45-year-old senior chief petty officer passed away. I wonder how his shipmates feel — all his commanding officers, supervisors and fellow workers who he worked with in his 28 years of naval service.

For this chief died of alcoholism, not the quick and sure death of a car crash or suicide, but the drawn out death of a body unable to operate any more due to the ravages of 28 years of drinking. It just quit. I don't know the full medical terminology for it. I think it started with alcoholic pancreatitis and just spread as more of his bodily functions

simply shut down.

During his last days, his shipmates got to see him and are probably concerned that they did not do more when he received a DWI less than a week ago. But they need not worry, it was probably too late by then.

But what of the previous shipmates, COs, etc., in the 15 years the Navy has been "actively pursuing" this disease. He only had two DWIs during that period. And how many times did he come to work with a hangover or was sick with gastritis or all the other symptoms we have been "taught" are indicative of the disease of alcoholism? In order to "save his career," how many concerned shipmates did nothing because he was a good worker, a nice guy and entitled to his fun? Or was it just apathy? Did they contribute to his ultimate death? Do we contribute by not fully manning our drug and alcohol counsellor billets?

Name withheld by request

• This letter to Approach is a result of a September 1984 article, "Confessions of a Skipper," by Capt. S.P. Dunlap, Director, Aviation Safety Programs, Naval Safety Center. Capt. Dunlap was COMNAVAIRLANT Safety Director when he wrote the article which was about an alcoholic crewman who died in an automobile accident. The beginning and concluding lines of his article were "Frankly, I feel like hell." ◄

A LOOSE FASTENER CAN RUIN YOUR WHOLE DAY

Poster idea contributed by Lcdr. Cal Langford and AD1 Toby Espiritu, VAQ-34 Safety Department.

Hail & Farewell

They were lucky... this time.
Do you have a
weather avoidance plan?

Poster idea contributed by Mr. Bob Davidson, NAESU Rep, VP 91